

Supplemental Information for “*Meta-analysis of cannabinoid ligand binding affinity and cannabinoid receptor distribution: interspecies differences,*” by McPartland, Glass, Pertwee

Table S-2

Chronologically-listed studies regarding the affinity of cannabinoid ligands for human (*Hs*) and mouse (*Mm*) cannabinoid receptors, measured by displacement of radioligands as described in footnotes

ligand ¹	reference, notes ²	<i>HsCB</i> ₁ affinity ³	<i>MmCB</i> ₁ affinity ³	<i>HsCB</i> ₂ affinity ³	<i>MmCB</i> ₂ affinity ³	Direct comparisons ⁴
THC	Fride et al., 1995; [³ H]HU, <i>MmCB</i> 1 nativeG		1.8 ± 0.3 SE n=3			
THC	Yang et al., 1996; [³ H]AEA, <i>MmCB</i> 1, native embryo		1.8 Ø SE n=?			
THC	Shire et al., 1996; [³ H]CP, <i>MmCB</i> 2, trans3			16.0 ± 5.0 SE n=4	12.6 ± 1.2 SE n=4	<i>H2M2</i> :1.3 T:T
THC	Burkey et al., 1997; [³ H]SR, <i>MmCB</i> 1 nativeB		144 ± 63 SE n=3			
THC	Gatley et al., 1997; [³ H]CP, <i>MmCB</i> 1, nativeD		131 ± 38 SD n=3			
THC	Schatz et al., 1997; [³ H]CP, <i>MmCB</i> 2, nativeK				11.8 ± 0.7 S? n=?	
THC	Griffin et al., 2000; [³ H]CP, <i>MmCB</i> 2, trans4			44.9 ± 21.8 SE n=2	27.3 ± 3.5 SE n=2	
THC	Iwamura et al., 2001; [³ H]CP, <i>MmCB</i> 1nativeD, <i>MmCB</i> 2trans2	5.05 ± 0.65 SE n=3	8.33 ± 3.45 SE n=3	3.13 ± 0.34 SE n=3	1.73 ± 0.09 SE n=3	<i>HIMI</i> :0.6 T:N <i>H2M2</i> :1.8 T:T
THC	Govaerts et al., 2004 [³ H]WIN, <i>MmCB</i> 1 nativeD	32 ± 0.6 SE n~5	98 ± 42 SE n~5			<i>HI:MI</i> :0.3 T:N
CBD	Thomas et al., 2004; [³ H]CP, <i>MmCB</i> 1, nativeB		4900 ± 2346 SE n~8			

CBN	Schatz et al., 1997; [³ H]CP, <i>MmCB2</i> , nativeK				2.3 ± 0.3 S? n=?	
AEA	Khanolkar et al., 1996; [³ H]CP, <i>MmCB2</i> , nativeJ +PMSF				1926 ± 4.5 SE n=3	
AEA	Shire et al., 1996; [³ H]CP, <i>MmCB2</i> , trans3 ØPMSF			239 ± 88 SE n=4	260.0 ± 27.2 SE n=2	<i>H2:M2:0.9 T:T</i>
AEA	Yang et al., 1996; [³ H]AEA, <i>MmCB1</i> , nativeA, native embryo, ØPMSF		nativeA: Kd 1.8 ØSE n=? embryo Kd 1.0 ØSE n=?			
AEA	Burkey et al., 1997; [³ H]SR, <i>MmCB1</i> nativeB, ØPMSF		585 ± 105 SE n=3			
AEA	Basavarajappa et al., 1998; [³ H]CP, <i>MmCB1</i> , nativeB, +PMSF		1610 ± 20 SE n=3			
AEA	Lin et al., 1998; [³ H]CP, <i>MmCB2</i> , nativeJ, ØPMSF				1930 ± 204 SE n=4	
AEA	Griffin et al., 2000; [³ H]CP, <i>MmCB2</i> , trans4, +PMSF			306 ± 48 SE n=2	1480 ± 134 SE n=2	<i>H2:M2:0.2 T:T</i>
AEA	Hungund + Basavarajappa, 2000 [³ H]CP, <i>MmCB1</i> , nativeB, C57BL/6, DBA/2 strains, +PMSF		C57BL/6: 1220 ± 110 SE DBA/2: 2170 ± 210 SE all n=3			
AEA	Lichtman et al., 2002; [³ H]CP, <i>MmCB1</i> , nativeC, +ØPMSF		+PMSF: 61 ± 52.0 SE ØPMSF: 792 ± 460 SE all n=3			
AEA	McAllister et al., 2003; [³ H]CP, <i>MmCB1</i> , trans4, +PMSF		300 ± 127 SE n=3			
AEA	Liu et al., 2006; [³ H]CP, CB1nativeC, +PMSF		$13.2 \pm$ S? n=? $16.3 \pm$ S? n=?			

metA	Khanolkar et al., 1996; [³ H]CP, <i>MmCB2</i> , nativeJ, +PMSF				815 Ø SE n=3	
metA	Gatley et al., 1997; [³ H]CP, <i>MmCB1</i> , nativeD, ØPMSF		96 ± 41 SD n=3			
metA	Lin et al., 1998; [³ H]CP, <i>MmCB2</i> , nativeJ, ØPMSF				868 ± 61.5 SE n=2	
metA	Lichtman et al., 2002; [³ H]CP, <i>MmCB1</i> , nativeC, +PMSF		75 ± 155 SE n=3			
2-AG	Hungund + Basavarajappa, 2000 [³ H]CP, <i>MmCB1</i> , nativeB, C57BL/6, DBA/2 strains, +PMSF		C57BL/6: 480 ± 10 SE DBA/2: 2510 ± 200 SE all n=3			
2-AG	Lichtman et al., 2002 ; [³ H]CP, <i>MmCB1</i> , nativeC, +PMSF		1890 ± 681 SE n=3			
2-AG	Alberich Jordà et al., 2004; [³ H]2-AG; <i>MmCB2</i> , trans 32D/G-CSF-R				Kd 94 ± 17 SD n=3	
CP	Kaminski et al., 1992; [³ H]CP, <i>MmCB2</i> , nativeJ				Kd 0.910 Ø SE n=?	
CP	Abood et al., 1993; [³ H]CP, <i>MmCB1</i> , nativeB		Kd 4.6 ± 1.6 SE n=5			
CP	Fan et al., 1996; [³ H]CP, <i>MmCB1</i> , nativeD		Kd 2.2 ± 0.44 SE n=5			
CP	Yang et al., 1996; [³ H]AEA, <i>MmCB1</i> , native embryo		1.8 ØSE n=?			
CP	Shire et al., 1996; [³ H]CP, <i>MmCB2</i> , trans3			2.4 ± 0.64 SE n=4	4.5 ± 0.4 SE n=4	<i>H2:M2:0.5 T:T</i>
CP	Abood et al, 1997; [³ H]CP,		Kd 0.90 ± 0.13 SE			

	<i>MmCB1</i> , trans4		n=3			
CP	Burkey et al., 1997; [³ H]SR, <i>MmCB1</i> nativeB		126 ± 73 SE n=3			
CP	Gatley et al., 1997; [³ H]CP, <i>MmCB1</i> , nativeD		0.9 ± 0.4 SD n=3			
CP	Schatz et al., 1997; [³ H]CP, <i>MmCB2</i> , nativeK				1.9 ± 0.7 S? n=?	
CP	Basavarajappa et al., 1998; [³ H]CP, <i>MmCB1</i> , nativeB		Kd 2.3 ± 0.2 SE n=3			
CP	Griffin et al., 1999 [³ H]CP, trans4, nativeB, nativeD		Kd 1.5 ± 0.12 SE n~5			
CP	Buckley et al., 2000 ; [³ H]CP, <i>MmCB1</i> , nativeB, nativeJ		Kd 1.66 Ø SE n = 3		Kd 0.36 Ø SE n = 3	<i>Mm</i> 1:2: 4.6 N:N
CP	Griffin et al., 2000; [³ H]CP, <i>MmCB2</i> , trans4			0.88 ± 0.09 SE n=2	0.73 ± 0.20 SE n=2	<i>H2:M2:1.2 T:T</i>
CP	Hungund + Basavarajappa, 2000 [³ H]CP, <i>MmCB1</i> , nativeB, C57BL/6, DBA/2 strains		C57BL/6 Kd 0.68 ± 0.15 SE DBA/2 Kd 2.21 ± 0.56 SE all n=3			
CP	Nakazi et al., 2000; [³ H]WIN <i>MmCB1</i> , nativeC, Log		0.50 ± 0.025 SE n~3.5			
CP	Iwamura et al., 2001; [³ H]CP, <i>MmCB1+CB2</i> nativeD+nativeK		Kd 0.16 Ø SE n=?		Kd 0.16 ØSE n=?	
CP	Bass et al., 2002 [³ H]CP, <i>MmCB1</i> , nativeB		Kd 0.690 Ø SE n=3			
CP	Lichtman et al., 2002; [³ H]CP, <i>MmCB1</i> , nativeC		0.49 ± SE 0.07 n=3			
CP	McAllister et al., 2003; [³ H]CP,		Kd 1.5 ± 0.48 SE n=3			

	<i>MmCB1, trans4</i>					
CP	Olson et al., 2003; [³ H]CP, <i>MmCB2, trans BHK cells</i>				Kd 0.35 ± 0.04 SD n=3 Ki 0.36 ± 0.25 SD n=3	
CP	Alberich Jordà et al., 2004; [³ H]CP; <i>MmCB2, trans 32D/G-CSF-R cells</i>				Kd 0.409 ± 0.03 SD n=3	
CP	Govaerts et al., 2004 <i>MmCB1 nativeD, [³H]WIN</i> <i>MmCB2 nativeJ, [³H]CP</i>	7 ± 0.5 SE n~5	0.30 ± 0.1 SE n~5			<i>H1:MI:23.3 T:N</i>
CP	Thomas et al., 2004; [³ H]CP, <i>MmCB1, nativeB</i>		Kd 2.31 ± 0 SE n=?			
WIN	Das et al., 1995; [³ H]WIN, <i>MmCB1, native uterus</i> ,		Kd 2.4 ± 0 SE n=2			
WIN	Shire et al., 1996; [³ H]CP, <i>MmCB2, trans3</i>			3.7 ± 1.2 SE n=4	23.5 ± 4.1 SE n=4	<i>H2:M2:0.2 T:T</i>
WIN	Skaper et al., 1996; [³ H]WIN, <i>MmCB1, nativeD</i>		Kd1 1.6 ± 1.0 SD n=7 Kd2 11.0 ± 1.5 SD n=7			
WIN	Yang et al., 1996; [³ H]AEA, [³ H]WIN, <i>MmCB1, native embryo</i> ,		[³ H]WIN Kd 1.2 OSE n=? [³ H]AEA Ki 2.1 OSE n=?			
WIN	Gatley et al., 1997; [³ H]CP, <i>MmCB1, nativeD</i>		12 ± 3 SD n=3			
WIN	Schatz et al., 1997; [³ H]CP, <i>MmCB2, nativeK</i>				6.8 ± 0.6 S? n=?	
WIN	Griffin et al., 2000; [³ H]CP, <i>MmCB2, trans4,</i>			1.19 ± 0.05 SE n=2	9.46 ± 0.65 SE n=2	<i>H2:M2:0.1 T:T</i>
WIN	Nakazi et al., 2000; [³ H]WIN <i>MmCB1, nativeC</i>		Kd 2.53 ± 0.21 SE n=4 Ki 6.45 ± 1.7 SE			

			n~3.5			
WIN	Iwamura et al., 2001; [³ H]CP, <i>MmCB1nativeD</i> , <i>MmCB2trans2</i>	9.87 ± 1.52 SE n=3	0.41 ± 0.16 SE n=3	0.29 ± 0.12 SE n=3	0.56 ± 0.02 SE n=3	<i>H1:M1:24.1 T:N</i> <i>H2:M2:0.5 T:N</i>
WIN	McAllister et al., 2003; [³ H]CP, <i>MmCB1</i> , trans4,		12 ± 3.3 SE n=3			
WIN	Olson et al., 2003; [³ H]CP, <i>MmCB2</i> , trans BHK cells,				2.49 ± 0.8 SD n=3	
WIN	Govaerts et al., 2004 <i>MmCB1 nativeD</i> , [³ H]WIN <i>MmCB2 nativeJ</i> , [³ H]CP	129 ± 18 SE n~5	7 ± 4.5 SE n~5	17 ± 2 SE n~5	5 ± 5 SE n~5	<i>H1:M1:18.4 T:N</i> <i>H2:M2:3.4 T:N</i>
WIN	Deng et al., 2005; [³ H]SR, <i>MmCB1</i> , nativeE		20 Ø SE n=4			
WIN	Paugh et al., 2006; [³ H]CP, Log <i>MmCB1 nativeD</i> , trans2; <i>HsCB1trans4</i> , <i>HsCB2trans2</i>	24.0 ± 10 SE n~3.5	nativeD: 4.4 ± 2 SE trans2: 11.0 ± 3.5 SE all n~3.5	1.7 ± 0.23 SE n=4		<i>H1:M1:6.0 T:N</i> 2.2 T:T
HU	Burkey et al., 1997; [³ H]SR, <i>MmCB1 nativeB</i> ,		1.56 ± 0.25 SE n=3			
SR	Shire et al., 1996; [³ H]CP, <i>MmCB2</i> , trans3,			>1000 ØSE n=4	>1000 ØSE n=4	<i>H2:M2:1.0 T:T</i>
SR	Yang et al., 1996; [³ H]AEA, <i>MmCB1</i> , native embryo,		1.4 ØSE n=?			
SR	Abood et al., 1997; [³ H]SR, <i>MmCB1</i> , trans4, nativeB, nativeG		trans4 Kd 0.73 ± 0.13 SE nativeB Kd 0.16 ± 0.012 SE nativeG Kd 0.182 ± 0.08 SE all n=3			
SR	Burkey et al., 1997 <i>MmCB1</i> , [³ H]SR, nativeB		Kd 10.4 Ø SE n=?			

SR	Gatley et al., 1997; [³ H]CP, <i>MmCB1</i> , nativeD		16 ± 16 SD n=3			
SR	Lan et al., 1999 [³ H]CP, nativeJ			1640 ± 91.8 SE n=3		
SR	Hungund + Basavarajappa, 2000 [³ H]CP, <i>MmCB1</i> , nativeB, C57BL/6, DBA/2 strains		C57BL/6: 5.1 ± 0.7 SE DBA/2: 7.5 ± 0.5 SE all n=3			
SR	Nakazi et al., 2000 [³ H]WIN, <i>MmCB1</i> , nativeC		2.0 ± 0.28 SE n~3.5			
SR	Selley et al., 2001 [³ H]SR, native assortment		nativeD Kd 0.21 ± 0.07 SE nativeE Kd 0.19 ± 0.03 SE striatum/GP Kd 0.13 ± 0.03 SE nativeC Kd 0.13 ± 0.01 SE all n=3			
SR	Bass et al., 2002 [³ H]CP, <i>MmCB1</i> , nativeB		7 ± 2 SE n=3			
SR	McAllister et al., 2003; [³ H]CP, <i>MmCB1</i> , trans4		4.8 ± 2.0 SE n=3			
SR	Ruiu et al., 2003; [³ H]CP, <i>MmCB1</i> , nativeB,		1.8 ± 0.07 SE n=4			
SR	Wang et al., 2003; [³ H]SR <i>MmCB1</i> , nativeB		Kd $0.175 \pm S?$ n=?			
SR	Ferrarini et al., 2004 [³ H]CP, nativeB, nativeJ		1.8 ± 0.75 SE n=5		514 ± 30 SE n=5	<i>Mm1:2:0.0035</i> N:N
SR	Govaerts et al., 2004 ?PMSF <i>MmCB1</i> nativeD, [³ H]WIN <i>MmCB2</i> nativeJ, [³ H]CP	33 ± 13 SE n~5	9 ± 6 SE n~5	2138 ± 753 SE n~5	1698 ± 1318 SE n~5	<i>H1:M1:3.67 T:N</i> <i>H2:M2:1.3 T:N</i>

SR	Murineddu et al., 2005; [³ H]CP, <i>MmCB1nativeC</i> , <i>MmCB2nativeJ</i> ,		Cited Ruiu et al, 2003		514 ± 30 SE n=5	
SR	Sim-Selley et al., 2006 [³ H]SR, <i>MmCB1nativeE</i> , <i>MmCB1native striatum/GP</i>		nativeE 0.173 ± 0.028 SE n=16 striatum/GP 0.120 ± 0.17 SE n=16			

¹ Ligands: THC, Δ⁹-tetrahydrocannabinol; CBD, cannabidiol; CBN, cannabinol; AEA, anandamide (*N*-arachidonoyl ethanolamine); metA, *R*-(+)-methanandamide; 2AG, *sn*-2 arachidonoyl glycerol; CP, CP55,940; WIN, WIN55212-2; HU, HU210 (11-OH-Δ⁹-THC-dimethylheptyl); SR, SR141716A.

² References are cited below; Methodological notes: radioligand used in study: [³H]CP, [³H]CP55,940; [³H]SR, [³H]SR141716A; [³H]WIN, [³H]WIN55212-2; [³H]HU, [³H]HU243; [³H]BAY, [³H]BAY38-7271; [³H]THC-DMH, [³H]11-OH-Δ⁹-THC-dimethylheptyl; [³H]AEA, [³H]anandamide. Note that HU210 is not HU243 (3-dimethylheptyl-11-hydroxyhexahydrocannabinol, namely reduced HU210, carrying no double bond), and HU210 is not equivalent to 11-OH-Δ⁹-THC-DMH.

Tissues or cells used in study were native or transfected. Native included: A = brain homogenates (unspecified), B = whole brain homogenates, C = cerebrum (cortical) homogenates or ‘forebrain’ homogenates, D = cerebellum homogenates, E = hippocampus homogenates, F = cortex and caudate-putamen slices, G = neuroblastoma (*Mm* N18TG2 or N1E-115) cells, H = *Hs* monocyte (U937) cells, J = whole spleen homogenates, K = splenocyte homogenates, L = tonsil homogenates, M = leukemia cells, N = *Rn* RBL-2H3 leukemia cells. Transfected cells included: 0 = cell type not specified, 1 = AtT-20 cells, 2 = CHO cells, 3 = COS cells, 4 = HEK-293 cells, 5 = LtK cells, 6 = *Xenopus* oocytes, 7 = Sf9 cells.

“Sect” indicates tissues were slide-mounted as sections or minced, rather than homogenized into membrane pellets.

“Centri” indicates free and bound radioligand was separated by centrifugation, rather than rapid filtration.

“OPMSF” indicates the absence of phenylmethylsulfonyl fluoride or no statement concerning its use, whereas “+PMSF” indicates the presence of PMSF or another endocannabinoid enzyme inhibitor.

³ ligand affinity measured in nM units as Kd or Ki (“Kd” and “Ki” differentiated when indicated, and the rest are Ki measurements); followed by n = sample size (number of independent experiments); followed by measure of variance reported in the study: SD = standard deviation, SE = standard error (SD = SE x √n), S? = variance not specified in original publication; confidence intervals (95%) were transformed to standard errors using the formula SE = (upper limit – lower limit)/3.92.

⁴ Direct comparisons: *H1:R1* indicates original study compared ligand affinity at *HsCB₁* versus *RnCB₁*; *H2:R2* indicates original study compared ligand affinity at *HsCB₂* versus *RnCB₂*; *Hs1:2*: indicates original study compared ligand affinity at *HsCB₁* versus *HsCB₂*; *Rn1:2*: indicates original study compared ligand affinity at *RnCB₁* versus *RnCB₂*. Comparisons include: T = transfected receptor, N = native receptor; comparisons are presented as ratios.

⁵ Studies that used [³H] Δ^8 -THC or [³H]TMA ([³H]-5'-trimethylammonium Δ^9 -THC) are presented here for historical interest and were not subjected to data synthesis. These ligands did not exhibit saturability or proved irrelevant in typical animal behavioral models of cannabinoid activity.

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